

EAST Search History

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L6	1712	(email e-mail mail messag\$3 electronic adj object).ab. and (serial sequen\$4 designated) adj2 (operat\$3 order service) and (@ad<"19990329" @rlad<"19990329")	US-PGPUB; USPAT	OR	ON	2006/12/05 09:59
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EAST Search History

L12	14	(routing path) same (serial sequen\$4 designated predetermined predefined) adj (operat\$3 order).ab. and (email e-mail mail messag\$3 (digital digitized electronic) adj object) and (@ad<"19990329" @rlad<"19990329")	US-PGPUB; USPAT	OR	ON	2006/12/05 10:09
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L16	21	(email e-mail mail messag\$3 (digital digitized electronic) adj object).ab. and (routing) same (serial sequen\$4) adj (operat\$3 order) and (@ad<"19990329" @rlad<"19990329") and (folder group subset instructions script state event)	US-PGPUB; USPAT	OR	ON	2006/12/05 10:14
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L18	13	(email e-mail mail messag\$3 (digital digitized electronic) adj object).ab. and (routing) same (seri\$2 sequen\$4) adj (operat\$3 order) and (@ad<"19990329" @rlad<"19990329") and (folder group subset) and (instructions script) and (state event)	US-PGPUB; USPAT	OR	ON	2006/12/05 10:21

EAST Search History

L21	2	(email e-mail mail messag\$3 (digital digitized electronic) adj (file component object)) and (routing) same (seri\$2 same sequen\$4) with (operat\$3 order) and (@ad<"19990329" @rlad<"19990329") and (folder group subset) and (instructions script) and (state event)	US-PGPUB; USPAT	OR	ON	2006/12/05 10:24
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US006701341B1

(12) **United States Patent**
Wu et al.

(10) **Patent No.:** **US 6,701,341 B1**
(45) **Date of Patent:** **Mar. 2, 2004**

(54) **SCALABLE REAL-TIME ULTRASOUND
INFORMATION PROCESSING SYSTEM**

(75) **Inventors:** **Anthony Wu**, San Jose, CA (US);
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(73) **Assignee:** **U-Systems, Inc.**, Los Altos, CA (US)

(*) **Notice:** Subject to any disclaimer, the term of this
patent is extended or adjusted under 35
U.S.C. 154(b) by 0 days.

(21) **Appl. No.:** **09/449,095**

(22) **Filed:** **Nov. 24, 1999**

Related U.S. Application Data

(63) Continuation-in-part of application No. 09/224,635, filed on
Dec. 31, 1998, now Pat. No. 6,547,730.

(51) **Int. Cl.⁷** **G06F 15/16**

(52) **U.S. Cl.** **709/200; 709/200; 709/101;
709/106; 709/201; 709/205; 128/915; 128/916;
600/437; 600/442; 600/447; 600/453; 600/345;
600/502; 600/810; 600/348**

(58) **Field of Search** **709/101, 106,
709/201, 205**

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(List continued on next page.)

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Assistant Examiner—Young N Won

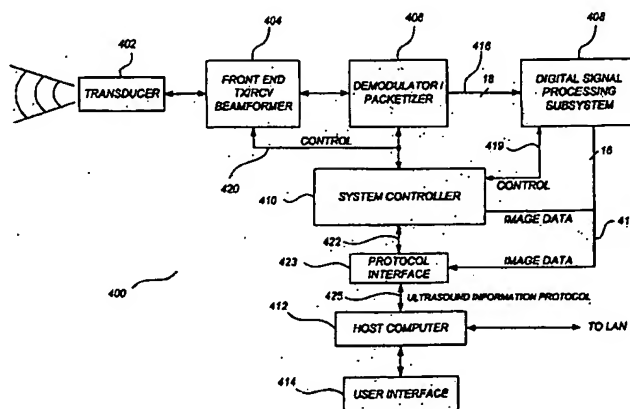
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Ivan S. Kavrukov

(57)

ABSTRACT

An ultrasound information processing system is disclosed in which ultrasound image data is packetized into ultrasound information packets and routed to one or more of a plurality of processors for performing image processing operations on the ultrasound image data, the ultrasound information packets being routed according to entries in a host-programmable routing table. A common distribution bus is coupled between packetizing circuitry and dedicated input buffers corresponding to each processor for distributing the ultrasound information packets, and a common output bus is used to transfer processed image data from the processors to an output device. The disclosed ultrasound information processing system architecture allows for a high throughput rate for accommodating real-time image processing operations, while also allowing for ready programmability and upgradability. Advantageously, the disclosed ultrasound information processing system may be readily upgraded by coupling additional processors to the common distribution bus and the common output bus and by reprogramming the routing table to include the additional processors as destinations for the ultrasound information packets. The disclosed ultrasound information processing system architecture also provides for added field reliability by providing for an optional spare processor coupled to the common distribution bus and the common output bus, wherein upon detection of a failure of one of the existing processors, the optional spare processor may be loaded with a copy of a program being run by the failing processor and the routing table may be automatically modified to redirect ultrasound data packets from the failing processor to the spare processor.

14 Claims, 18 Drawing Sheets



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L22	4	(email e-mail mail messag\$3 file component object) and (routing) same (seri\$2 same sequen\$6) with (operat\$3 order) and (@ad<"19990329" @rlad<"19990329") and (folder group subset) and (instructions script) and (state event)	US-PGPUB; USPAT	OR	ON	2006/12/05 10:26
L23	7	(email e-mail mail messag\$3 file component object) and (routing) same (seri\$2 same sequen\$6) with (operat\$3 order) and (@ad<"19990329" @rlad<"19990329") and (folder group subset) and (instructions script executable adj code program application applet) and (state event)	US-PGPUB; USPAT	OR	ON	2006/12/05 10:28
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EAST Search History

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